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ABSTRACT

This study evaluated the effectiveness of a self-contained classroom approach in comparison with two other reading approaches. The self-contained approach classes consisted of fifteen pupils, all nominated by their teachers. In the self-contained approach, reading and communication skills were given the most emphasis. The students in the other two approaches were in a regular second or third grade classroom, with each child in one of the groups receiving at least ten minutes per day instructional time by the reading specialists. The other group was designated as a control group. All three treatment groups were administered four pretest measures: Primary Mental Abilities Test; Metropolitan Achievement Test-Reading; Metropolitan Achievement Test, Word Discrimination; and Bender Visual Motor Gestalt Test. Posttest measures consisted of the Metropolitan Achievement Test, Word Discrimination and Reading subtests; the Gray Oral Reading Test; The Wide Range Achievement Test, Spelling subtest; and Bender Visual Motor Gestalt Test. The results indicated no significant differences among the three groups. (WR)

Research Brief

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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AN EVALUATION OF THREE APPROACHES TO READING IMPROVEMENT

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OF
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Department of Research and Development

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Miss Jan Britt, Secretary, Testing Office
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All School Psychologists serving elementary
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Administration:

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BELLEVUE PUBLIC SCHOOLS
Bellevue, Washington
11 June 1971

AN EVALUATION OF THREE APPROACHES TO READING IMPROVEMENT

In 1970-71 the Bellevue School District established classrooms in nine of its elementary schools to serve the needs of those children in the primary grades with apparent learning disabilities. Class size was limited to fifteen students nominated by the teachers who had worked with them in grades one and two and screened by reading specialists and by guidance team members.

Guidelines for the nomination of these children included:

1. An indication of normal intelligence.
2. An academic performance level in reading, spelling, writing, or arithmetic below what could be expected for grade level and indicated ability.
3. No major behavioral problems.
4. No serious physical and/or neurological difficulties.

Experienced teachers, with varying amounts of special training in the problems of children with learning disabilities, were chosen for these classrooms. Reading and communications skills were given major emphasis. Equipment and materials used in the rooms varied from building to building.

Comparison Groups.

In September 1970 an evaluation of the effectiveness of the self-contained classroom approach outlined above in comparison with two other approaches was undertaken by the Bellevue School District. Five children from each of these nine classrooms were randomly selected as the first experimental group (E_1). On the basis of the same criteria children were identified in each of twelve schools which did not have the learning disability classrooms. From these; seven children were selected randomly from each school and divided into two groups. The approach with one of these groups provided for at least ten minutes per day average instructional time for each child by the reading specialist. Their placement was in a regular second or third grade classroom. This group was designated as the second experimental group. The other group of non-laboratory room children, also in regular second and third grade classrooms, was designated as a control group. Although the reading specialist did on occasion work with them, there was no attempt made to provide them with at least ten minutes each day of reading instruction.

The division of the randomly selected children in the non-laboratory schools into the second experimental and control groups was done in the following manner in order to equate these groups as nearly as possible. The seven children at each school were ranked on the basis of their Metropolitan Achievement Test "Reading" pre-test score. After random pre-designation of six schools to have four experimental (E_2) and three control (C_1) subjects and

six other schools to have three experimental and four control subjects, the top two students were then randomly assigned to either the experimental (E₂) group or the "control group". The third and fourth children were randomly assigned to the two groups as were those ranked fifth and sixth. The seventh child was assigned in accordance with the pre-designation as to whether that school was to have four "experimental" or four "control" children.

Table I shows the final makeup of groups E₁, E₂ and C₁ by sex, grade level, and number of children involved.*

Pre-test Equivalence of Groups.

All three treatment groups (E₁, E₂ and C₁) were examined for equivalence on four pre-test measures: Primary Mental Abilities Test; Metropolitan Achievement Test-Reading; Metropolitan Achievement Test-Word Discrimination; and Bender Visual Motor Gestalt Test-error score. No significant differences were found among them.

Of interest was the finding that all boys combined were significantly higher (.005 level of confidence) than all girls combined on the Primary Mental Abilities Test and higher at a .10 level of confidence on the Bender Visual Motor Gestalt Test, suggesting that girls in all three programs had more severe disabilities in other areas rather than in reading per se. That is, girls with the same general level of reading performance as the boys possibly had more severe basic handicaps.

Instruction Time - E₂ and C₁.

Reading specialists were asked to keep a time log of time spent with E₂ and C₁ children during three sample weeks. They reported that children in Group E₂ received an average of 10.91 minutes instruction in reading each day from the reading specialist and that the children in Group C₁ averaged 3.39 minutes per day of instruction from the reading specialist. The average difference in the amount of daily reading instructional time per child between these two groups for these three sample weeks was 7.52 minutes.

Teacher Questionnaire Response.

The teachers of the E₁ children, the reading specialists in those buildings having learning disability classrooms, and the reading specialists who instructed the E₂ and the C₁ children were asked to respond to a questionnaire dealing with the three approaches to reading improvement in December 1970 and in February 1971. Each teacher was asked to comment specifically upon:

- * Some children transferred out of the various programs or were ill at the time of post-testing.

TABLE I

DISTRIBUTION OF 103 CHILDREN IN THREE APPROACHES TO READING IMPROVEMENT

	E ₁	E ₂	C ₁
2nd Grade Boys	11	11	14*
3rd Grade Boys	<u>13</u>	<u>9</u>	<u>9</u>
Total Boys	24	20	23
2nd Grade Girls	3	8*	5
3rd Grade Girls	<u>7</u>	<u>6</u>	<u>7</u>
Total Girls	10	14	12
Total E ₁	34	Total E ₂ 34	Total C ₁ 35

* One child in this group was described as a first grade retaineer.

1. Materials, Facilities, and Support
2. Instructional Features
3. Characteristics of the Children
4. Student Achievement
5. Student Attitudes

A brief summary of their answers indicated the following:

All three groups of teachers indicated a need for more materials with which to do a better job. In some instances, individual school funds had been used to purchase desired materials.

Room facilities were considered to be generally adequate for E1 classes but the reading specialists serving the E2 and C1 children found their facilities to be less adequate.

Support from building, curriculum, and administrative personnel was described as very adequate by all three groups of teachers.

There was no specific program prescribed or followed in any of the three approaches which was designed for children with learning disabilities. Both individual instruction and group instruction were used in the three situations and a desire to do more individualized teaching was expressed.

The children were deemed, generally, to be reading below grade level; however, only a few were considered to be making little or no progress in reading at the time the questionnaires were being answered.

Student attitudes toward reading ranged from moderate acceptance to enthusiastic acceptance of reading. Approximately six children were reported in E1 schools and six in the E2/C1 schools as being very discouraged about their lack of progress.

In their general comments, the teachers expressed concern over the future placement of their present pupils; over the criteria for the selection of the next class of children for their rooms; and the lack of similarity of program from school to school. Observed characteristics of these children, as reported by all three groups of teachers, can be used in the establishment of improved criteria for the selection of new candidates for such assistance and perhaps in the future planning of instructional programs.

Each group of teachers felt that working with smaller groups of children was an important advantage of their approach.

Careful selection and training of the teachers working in the learning disability rooms was also stressed in the responses.

Post-test Comparisons.

The comparisons of the three groups were based upon the results of a post-test battery administered to each of the randomly chosen children. The children in all three groups were given the Metropolitan Achievement Test, Word Discrimination and Reading subtests; the Gray's Oral Reading Test; the Wide Range Achievement Test, Spelling subtest; and the Bender Visual Motor Gestalt Test.

The Analysis of Covariance statistical technique was used. Post-test group means were adjusted on the basis of pre-test scores as shown in Table II.

Table III gives a comparison of adjusted post-test means. Student's t test was used to compare each treatment group with each other group.

Table III indicates no significant intergroup differences in post-test means on the MAT Word Discrimination subtest. There is a significant difference at the .05 level of confidence in the MAT Reading subtest means between the E₁ and C₁ groups favoring the E₁ group (t = 2.493). A possibly significant t ratio of 2.193 favoring the E₁ group in comparison to the E₂ group was found on the Gray's Oral Reading Test means.*

No significant differences were observed in the intergroup comparisons of the post-test means of the WRAT Spelling subtest; the Bender Visual Motor Gestalt Error Scores; or the San Diego Inventory of Reading Attitude.

Table III displays a slight trend in mean scores favoring the E₁ children on the MAT subtests of Word Discrimination and Reading, with a stronger edge in the Gray's Oral Reading Test means. Group E₁ is also slightly ahead of E₂ in the WRAT Spelling subtest mean scores.

There is little difference between the three groups on their Bender Error Scores.

Groups E₁ and E₂ are both ahead of C₁ when the means of the San Diego Inventory of Reading Attitude scores are compared. This is an inventory of children's attitudes toward reading and related activities.

* This may also be a chance difference. The overall F-ratio for differences among all three groups was not significant on the Gray and thus the significance of the difference between two of the groups must be questioned.

TABLE II

PRE-TESTS AND POST-TESTS GIVEN TO CHILDREN
IN THREE COMPARISON GROUPS

Scores on the pre-tests in the left column were used to adjust the mean scores for the three groups on the corresponding post-tests at the right, prior to comparison of post-test means. The Analysis of Covariance statistical technique was used.

Pre-test Control Variables (Given Oct. 8-9, 1970)	Post-test Variables Compared (Given May 21-25, 1971)
1. Metropolitan Achievement Test, Primary I,A, Word Discrim- ination	1. Metropolitan Achievement Test, Primary II, A, Word Discrim- ination
2. Metropolitan Achievement Test, Primary I,A, Reading	2. Metropolitan Achievement Test, Primary II, A, Reading
3. Metropolitan Achievement Test, Primary I,A, Word Discrim- ination	3. Gray's Oral Reading Test, passage score.
4. Primary Mental Abilities Test, Intelligence Quotient	4. Wide Range Achievement Test, Spelling
5. Bender Visual Motor Gestalt Test, error score.	5. Bender Visual Motor Gestalt Test, error score.
6. Primary Mental Abilities Test, Intelligence Quotient	6. San Diego Inventory of Reading Attitude

TABLE III

COMPARISON OF ADJUSTED MEAN POST-TEST
SCORES FOR THREE EDUCATIONAL TREATMENT GROUPS

Using the Analysis of Covariance Statistical Technique, Means for a post-test were adjusted on the basis of related pre-test scores. The number of students in each group was:

Group E1 (Learning Disabilities Rooms)	34
Group E2 (Concentrated Reading Specialist help)	34
Group C1 (Less intensive Reading Specialist help)	35

Group	Subtest	Adjusted Mean	Mean Differences	
			E2	C1
E1	Metro Word Discrim.	31.12	+1.14	+1.24
	Metro Reading	34.68	+3.05	+5.12*
	Gray's Oral Reading	22.48	+4.11°	+2.73
	WRAT Spelling	34.25	+1.24	+0.05
	Bender Visual Motor Gestalt (Error)	3.40	+0.17	-0.15
	San Diego Inventory of Reading Attitude	15.81	+0.03	+1.01
E2	Metro Word Discrim.	29.98		+0.10
	Metro Reading	31.63		+2.07
	Gray's Oral Reading	18.37		-1.38
	WRAT Spelling	33.01		-1.19
	Bender Visual Motor Gestalt (Error)	3.57		-0.32
	San Diego Inventory of Reading Attitude	15.78		+0.98
C1	Metro Word Discrim.	29.88		
	Metro Reading	29.56		
	Gray's Oral Reading	19.75		
	WRAT Spelling	34.20		
	Bender Visual Motor Gestalt (Error)	3.25		
	San Diego Inventory of Reading Attitude	14.80		

Positive sign denotes difference favoring method to left.

Negative sign denotes difference favoring method at top.

* Significant difference; only five percent or smaller probability that this is a chance difference.

° Possibly significant difference. The t-ratio between these two groups met the requirement for significance at the .05 level of confidence. However, the F-ratio for significant mean variation among all three means was not significant. This presents a greater possibility that the E1, E2 mean difference is a chance difference.

From Table IV it is evident that Groups E₁ and E₂ made strong gains, in terms of Grade Equivalents, with gains of 1.3 years and 1.2 years, respectively, in the period of .75 years (7.5 months), on the MAT subtest Word Discrimination.

On the MAT subtest Reading, Group E₁ made a gain of 1.2 years during the same period of time (7.5 months) compared with a gain of .9 years for both Groups E₂ and C₁.

Changes in Bender Age equivalents (interpolated from Koppitz norms) are relatively small. Group differences probably are chance. It is of interest that this basic visual motor skill did not change more. Possible reasons are that this ability is recalcitrant to change in many of these children and/or that this was not an area of concentrated instruction.

The San Diego Inventory of Reading Attitude is designed to assess a child's affective reactions to reading. All three groups scored at stanine four when compared with the normative group for this test (pupils of San Diego County, California in 1961).

Summary and Conclusions.

- (1) Responses to the teacher survey suggested that additional teaching materials and equipment are needed in all situations; that better facilities are needed by the reading specialists; that criteria for selection of pupils need to be improved and that additional training for learning disability room teachers would be helpful.
- (2) The three groups of children selected were essentially equivalent on pre-test measures.
- (3) The statistical comparison of post-test scores displayed a perceptible trend favoring E₁ children over the other two groups. On all measures except the Bender the E₁ mean was the highest of the three; in one instance significantly higher than C₁, and in one instance significantly higher than E₂.
- (4) Although the means on the Gray's Oral Reading Test, the Bender and the Wide Range Achievement Test Spelling subtest were somewhat higher for the C₁ group than for the E₂ group, these differences were not significant.
- (5) On the major measures of reading skills (Metropolitan Achievement Test, Word Discrimination and Reading) and on the San Diego Inventory of Reading Attitude, E₂ children scored higher than the C₁ children. However, these differences were not statistically significant.

TABLE IV

GAINS FROM PRE-TESTS TO POST TESTS IN TERMS
OF GRADE OR AGE EQUIVALENTS

October 8-9, 1970 to May 21-25, 1971
(Approximately .75 years or 7.5 months)

METROPOLITAN READING ACHIEVEMENT TEST - WORD DISCRIMINATION

Group	Pre-Test		Post-Test		Grade Equiv. Gain
	Raw Score Mean	Grade or Age Equiv.	Raw Score Mean	Grade or Age Equiv.	
E1 (Learning Disab. Room)	28.12	2.3 Yrs.	31.21	3.6 Yrs.	1.3 Yrs.
E2 (Concentrated Reading Specialist help regular classroom)	26.94	2.2 Yrs.	29.62	3.4 Yrs.	1.2 Yrs.
C1 (Less concentrated Reading Specialist help regular classroom)	28.60	2.4 Yrs.	30.14	3.4 Yrs.	1.0 Yrs.

METROPOLITAN READING ACHIEVEMENT TEST - READING

E1	27.41	2.0 Yrs.	36.47	3.2 Yrs.	1.2 Yrs.
E2	21.26	1.8 Yrs.	29.00	2.7 Yrs.	.9 Yrs.
C1	26.06	1.9 Yrs.	30.37	2.8 Yrs.	.9 Yrs.

BENDER VISUAL MOTOR GESTALT TEST

E1	3.74	8 Yrs. 0 Mos.	3.35	8 Yrs. 2 Mos.	2 Mos.
E2	3.88	8 Yrs. 0 Mos.	3.53	8 Yrs. 1 Mo.	1 Mos.
C1	4.26	7 Yrs. 9 Mos.	3.23	8 Yrs. 3 Mos.	6 Mos.

- (6) . Gains in comparison with national norms by all groups, and by E₁ and E₂ groups in particular, appear to indicate the value of intensive work with children who have learning disabilities.